

DIAGNOSES OF NEW SPECIES OF
MACRUROUS DECAPOD CRUSTACEA FROM THE
„SIBOGA-EXPEDITION”

BY

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1. *Nephrops arafurensis* n. sp.

Station 262. Lat. $5^{\circ} 53'.8$ S., long. $132^{\circ} 48'.8$ E. Depth 560 M.¹⁾

Only one much damaged male was collected: the posterior half of the abdomen is wanting, as also the flagella of the external antennae and the thoracic legs of the 1st pair.

Cephalothorax and rostrum as in *Nephrops Thomsoni* Bate, but the lateral teeth of the rostrum are situated posterior to the middle of it. The lateral carinae on the gastric region converge backwards as in *Nephrops japonicus* Tapp. and are armed each with five sharp spines that are all slightly directed outward. Cephalothorax covered with numerous spines, besides those that exist also in *Nephrops Thomsoni*. Abdominal terga of the 1st—4th somites grooved and sculptured as in the european *Nephrops norvegicus*.

Thoracic and abdominal appendages resembling those of *Nephrops Thomsoni*.

Length of carapace (rostrum included) 56,5 m.m., length of rostrum 22,5 m.m.

2. *Pentacheles trispinosus* n. sp.

Station 38. Lat. $7^{\circ} 35'.4$ S., long. $117^{\circ} 28'.6$ E. Depth 521 M.

1) The depth is indicated in metres.

Station 45. Lat. $7^{\circ} 24' S.$, long. $118^{\circ} 15'.2 E.$ Depth 794 M.

Station 314. Lat. $7^{\circ} 36' S.$, long. $117^{\circ} 30'.8 E.$ Depth 694 M.

Station 316. Lat. $7^{\circ} 19'.4 S.$, long. $116^{\circ} 49'.5 E.$ Depth 538 M.

Closely related to *Pent. phosphorus* Alcock, but distinguished by the following. Lateral border of the carapace always armed with 17 spines, the anterior division with 5, the middle with 3, the posterior with 9; sublateral ridge on the branchial region not quite straight, but somewhat undulate and armed with 13 spines. Carapace two thirds a telson-length shorter than abdomen. The carinae of the first three abdominal terga culminate each in an acute, antorse spine; those of the 1st and 2nd small, equal, that of the 3rd twice or 3-times as long. Carina of the 4th tergum not ending in an acute spine, but with obtuse anterior extremity. Carinae of the 5th and 6th as in *Pent. phosphorus*. Abdominal terga somewhat uneven, tubercular, especially along the oblique grooves, that are as in *Pent. phosphorus*.

Outer angle of basal joint of antennular peduncle with two spinelets.

First pair of thoracic legs just as long as the body and similar to those of *Pent. phosphorus*, but the upper border of the palm armed with 6 or 7 spines along its whole length. Coxae of the 2nd and 3th legs armed with a strong spine.

Length of an adult, egg-bearing female 134 m.m.

3. *Arctus gibberosus* n. sp.

Stat. 99. Lat. $6^{\circ} 7'.5 N.$, long. $120^{\circ} 26' E.$ Depth 16—23 M.

Station 164. Lat. $1^{\circ} 42'.5 S.$, long. $130^{\circ} 47'.5 E.$ Depth 32 M.

Closely related, especially as regards the shape of its thoracic legs, to *A. sordidus* Stimps.

Carapace with three teeth in the middle line before the cervical groove, all three obtuse, the middle one even broadly rounded; behind the cervical groove a pair of two very small teeth situated abreast. Squamiform prominences on the carapace large, those of the

lateral carinae distinctly carinate. Frontal process twice as broad as long. Squamiform sculpture on the abdominal terga and pleura as in *A. sordidus*, but more conspicuous; fourth tergum much more prominent in the middle line than the rest.

Proximal (outer) squame of outer antennae as long as broad, outer border with three or four flattened teeth, inner with five or six. Lobes of the distal squame rounded, one more in number than in *A. sordidus*. Notch of first joint of sternum semicircular, fifth joint with median tubercle.

Thoracic legs with dark, slate-coloured rings as in *A. sordidus*, but no dark fleck on the first abdominal tergum.

Two young males, the larger 21 m.m. long, the outer antennae included.

This species is probably identical with *Scyllarus sordidus* Nob. from the Persian Gulf (Nobili, in: Bull. Muséum Paris, 1905, p. 160), and in this case Nobili's species may henceforth bear the name of *gibberosus*, because an *Arctus sordidus* has already been described by Stimpson; when they are different, then I propose for the Persian species the name of *Nobili*, at least when it really belongs to the genus *Arctus*.

4. *Arctus bicuspidatus* n. sp.

Station 310. Lat. 8° 30' S., long. 119° 7' 5 E. Depth 73 M.

Closely related to *Arctus Martensii* Pfeffer.

Carapace carrying two acute, slightly upturned teeth in the middle line, namely one on the anterior margin and a somewhat larger on the middle of the gastric region; no tooth immediately behind the cervical groove. Squamiform prominences on the gastric and cardiac regions indistinct. Orbits as in *A. Martensii*, situated just as near to the lateral margins. Branchial regions devoid of squamiform prominences between those of the hardly prominent, lateral carinae and those of the lateral margins. Frontal process less broad, only twice as broad as long. Areolated posterior part of the 1st abdominal tergum as long in the middle as laterally, the furrows between the areolae parallel with one another and with

the middle line. Four following somites indistinctly and obtusely carinate in the middle line, the carinae not at all prominent, but each tergum presenting a regular, symmetrical and arborescent figure. Calcified anterior part of the telson ending posteriorly in four sharp spines.

Proximal (outer) squame of outer antennae with two sharp teeth as in *A. Haanii* Berthold; inner border with five sharp teeth, the first considerably larger than the following.

Sternum less broad, less concave, first sternal joint flattened, not hollowed out.

Thoracic legs stouter, less slender than those of *A. Martensii*, with longitudinal grooves on their outer surface, except on the 1st pair; propodites of the 3rd legs distinctly compressed, $3\frac{1}{2}$ -times as long as their average breadth.

Length of the single female, that was collected, 25,5 m.m.

5. *Axius* (*Neaxius*?) *euryrhynchus* n. sp.

Station 86. Anchorage off Dongala, Palos-bay, Celebes.

Depth 36 M.

Rostrum broad, flattened, carinate in the middle line, slightly inclined downwards, reaching almost to the distal end of the 2nd joint of the antennular peduncle; at the level of the short, distinctly faceted and pigmented corneae the rostrum is a little constricted; the rounded, anterior border is notched in the middle and armed, on either side of this notch, with 7 or 8 upstanding teeth. The lateral margins are continued backward as carinate ridges until the middle of the gastric region.

Abdomen not yet once and a half as long as the carapace. Telson with a pointed tooth in the middle of its posterior margin, appearing without this tooth just as broad as long, no spinules on its upper surface. Caudal swimmerets as long as telson, exopodite obovate, once and a half as long as broad, the anterior and apical border beset with 19 small, sharp teeth.

Third joint of antennular peduncle twice as long as thick, a little longer than the 2nd; outer flagellum 2—3 times as thick

as the inner. Antennal peduncle with short, sharp stylocerite, scaphocerite large, triangular, acuminate, reaching to the middle of the penultimate joint of the peduncle.

Legs of 1st pair short and stout. Ischium with 2 teeth on the lower margin, merus with five. Carpus with a sharp tooth near the distal end of its lower margin. Fingers measuring two thirds of the length of the palm, immobile finger with a strong, very sharp tooth midway between the articulation and the tip and a few much smaller ones.

Length 11 m.m.

6. *Axius* (*Neaxius*?) *odontorhynchus* n. sp.

Station 260. Lat. 5° 36'.5 S., long. 132° 55'.2 E.

Depth 90 M.

A new species, probably of small size. Rostrum pointed, slightly inclined downward, triangular, measuring about one fifth of the length of the carapace, almost reaching to the distal end of the 1st joint of the antennular peduncle; the lateral margins of the rostrum that is once and a half as long as broad at its base, are armed each with 6 or 7, upstanding, subacute teeth. Lateral margins of the rostrum continued on to the gastric region, curved and carrying just at the curving two subacute teeth. Gastric region carinate in the middle line anteriorly and bidentate; between the median carina and the lateral ones a submedian carina with two teeth. Anterior border of the carapace unarmed, Cervical groove deep.

Second abdominal somite twice as long as the 1st, 2nd—6th subequal, telson twice as long as the 6th somite, one fourth longer than broad. Caudal swimmerets as long as the telson; exopodite oval, once and a half as long as broad, anterior border with 11 or 12 small, sharp teeth, posterior border with one strong tooth; endopodite half as broad as long, with a strong tooth at either extremity of the apical border that is straight and truncate.

Internal antennae a little longer than the carapace. Antennal thorns large. Legs of 1st pair unequal. Merus stout, once and a

half as long as broad, upper border strongly curved with one sharp tooth, lower margin with a dozen of small sharp teeth. Carpus short. Palm of the larger chelipede once and a half as long as the fingers, each of which with 8 or 9 obtuse teeth; in the smaller chelipede the fingers are as long as the palm and more faintly denticulate. Legs of the 3rd and of the 4th pair stout. The propodite of the 3rd pair 3-times, that of the 4th 4-times as long as broad; dactylus of these legs, almost half as long as the propodites, with spines on their lower margin and with a row of spines on the outer side.

Length of the single specimen 7.8 m.m., the carapace being 2,86 m.m. long, the abdomen 4.94 m.m.

Meticonarius n. g. ¹⁾

A new genus of the Family Axiidae.

Carapace about half as long as the abdomen, branchial regions somewhat swollen. Rostrum triangular, of good size, its margins unarmed, carinate in the middle line and continuous with the gastric region, which is rounded, like the rest of the carapace. Cervical groove indistinct. Carapace excavated posteriorly.

Pleura of the abdominal somites that barely overlap one another, rather small. Telson quadrate, truncate; caudal swimmerets broadly foliaceous, exopodite not divided by any suture.

Eyepeduncles subcylindrical, eyes at the rounded distal end, not faceted, faintly pigmented.

Antennular flagella subequal, longer than the peduncle, half as long as the carapace. Antennal thorns well developed, stylocerite small, scaphocerite large, spiniform.

Maxillipedes of the 2nd pair furnished with an exopodite, those of the 3rd pair pediform, without an exopodite.

Thoracic legs of 1st pair equal, larger than those of the 2nd. Propodites of the legs of the 3rd and 4th pairs compressed, oval, fringed with hairs, shorter than the carpus; dactylus shorter than

1) From *μετά, εικόν* and *Axius*.

the propodite, tapering. Legs of the 5th pair, in the male, subcheliform.

Abdominal appendages of the 1st somite, in the male, slender, uniramous, short. Those of the four following pairs biramous, the rami foliaceous, the exopodite broader and shorter than the endopodite that is furnished with a stylamblys.

7. *Meticonaxius monodon* n. g. n. sp.

Station 5. Lat. 7° 46' S., long. 114° 30'.5. Depth 330 M.

Carapace smooth, glabrous. Rostrum sharp, reaching just beyond the 1st joint of antennular peduncle. Abdomen hairy, especially the 3rd—5th somites, that are clothed with plumose, flexible, silk-like hairs, each hair inserted in a circular, circumvallated pit.

Sixth somite quadrate, a little shorter and less broad than the 2nd, that is slightly longer than the rest; pleura unarmed, rounded. Telson a little shorter than the 6th somite and, like the caudal swimmerets, without teeth or spinules.

Basipodite and merus of the thoracic legs of the 1st pair, that are of medium size, armed each with a sharp tooth on the lower margin; fingers slender, strongly compressed, pointed, the immobile finger with one sharp, characteristic tooth in the middle, prehensile edge of the arcuate dactylus entire and unarmed.

Length of single male specimen collected 23 m.m., carapace 8 m.m. long.

Anophthalmaxius n. g.

A new genus of the family Axiidae, chiefly characterized by the transformation of the eyepeduncles in two quadrangular plates, that are probably coalesced, not only with one another in the middle line, but also with the basal joints of the antennular peduncles; their upper surface is punctate and they are probably anteriorly emarginate. No trace of eyes at all. ¹⁾

1) Though in the single specimen, on which this genus was founded, the rostrum was rather badly damaged, the quadrangular plates appear to be uninjured and present apparently still their natural characters.

Gastric region not falling steeply to rostrum, but continuous with it. Cervical groove distinct. Carapace excavated posteriorly, posterior margin concave.

Abdominal pleura small, barely overlapping one another. No distinct suture on the exopodite of the last limb.

Flagella of the internal antennae longer than the peduncle. Stylocerite small, scaphocerite spiniform, of good size.

Maxillipedes of the 2nd and of the 3rd pair with slender exopodite, that of the 3rd pair consisting of a peduncle and an articulated flagellum.

Legs of 1st pair equal, chelate; those of the 2nd also equal and chelate, much smaller.

Legs of the three other pairs slender.

8. *Anophthalmaxius eccoptodactylus* n. sp.

Station 271. Lat. 5° 46'.7 S., long. 134° 0' E. Depth 1788 M.

Rostrum probably triangular and flattened, its lateral margins continued backward and reaching, like the median carina of the rostrum, to the middle of the gastric region.

Telson once and a half as long as broad, rounded posteriorly, lateral margins with 2 or 3 teeth, posterior margin with sharp median tooth. Caudal swimmerets not reaching beyond the telson, when directed backward; they are ovate, rounded apically, the exopodite once and a half as long as broad, the endopodite almost half as broad as long.

Internal antennae as long as the carapace, without the rostrum; 3rd joint of their peduncle once and a half as long as thick, a little longer than the 2nd. Scaphocerite of antennal peduncle reaching to the middle of the penultimate joint.

Lower margin of the merus of 1st pair of legs with five small, sharp teeth, upper margin with one. Chelae a little longer than the merus, fingers shorter than the palm, carpus short, triangular. Immobile finger acuminate, its tip not turned upward, armed with four teeth of which the first near the base is very large, and

fits in a concave notch of the dactylus, the other teeth small; the slightly curved dactylus carries a dozen very small teeth between the notch and the pointed extremity.

Length 15,4 m.m., the carapace, without the rostrum, measured in the middle line, 4,9 m.m. long, the abdomen 10,5 m.m., twice as long as the carapace.

9. *Axiopsis consobrina* n. sp.

Stat. 105. Lat. 6° 8' N., long. 121° 19' E. Depth 275 M.

Stat. 204. Lat. 4° 20' S., long. 122° 58' E. Between islands of Wowoni and Buton, northern entrance of Buton-strait. Depth from 75—94 M.

Stat. 305. Mid-channel in Solor-strait off Kampong Menanga. Depth 113 M.

Closely related to *Axiopsis serratifrons* A. M.-Edw., and apparently representing this littoral species at depths of 75—275 M. Rostrum triangular, a little narrower at its base than that of *A. serratifrons*, carrying five subacute teeth on its lateral margins; lateral prolongations on to the gastric region with 9 sharp teeth. Median ridge with 13 teeth, submedian ridges more or less converging backward and armed with 7—9 spines; in the type the submedian ridges are running, in their anterior half, distinctly nearer to the middle line than to the lateral ridges and there are then no teeth between the median row and the submedian ridges. The posterior margin of the pleura of the 2nd and 3rd somites curves regularly into the lower border, forming no angle at all and on those of the 4th an angle is barely distinguishable. Caudal fan much similar to that of *Ax. serratifrons*, but the telson is longer, once and a half as long as broad and the two pairs of spinules on the upper surface are situated more forward.

Larger chelipede as in *Ax. serratifrons*, but the slightly convex, outer surface of the palm is smooth, except near the flattened base of the immobile finger, where the palm is covered with some smooth, rounded granules. The chela of the left smaller leg has a different form from that of *Ax. serratifrons*. The palm narrow-

ing a little distally, is barely longer than the slender fingers that shut together; both the outer and the inner surface of the palm are a little convex and perfectly smooth.

Length 30 m.m.

10. *Axiopsis tenuicornis* n. sp.

Stat. 5. Lat. $7^{\circ} 46' S.$, long. $114^{\circ} 30'.5$. Depth 330 M.

Rostrum triangular, slightly concave, acute, measuring one fourth of the rest of the carapace and almost extending to the end of the 2nd joint of the antennular peduncle; lateral margins each with 2 acute spines. Prolongations of the latter on to the gastric region with 4 similar spines; gastric region with median carina armed with 4 equidistant spines; between the median carina and the lateral ones on each side another submedian ridge, carrying also 4 similar spines. Abdomen almost twice as long as the carapace. Sixth somite a little longer than the 2nd, very little broader than long. Telson a little longer than sixth somite, anteriorly one fourth longer than broad, its posterior border convex with short, acute, median spine, attached to the lower surface. Foliaceous lateral swimmerets as long as telson, exopodite obovate, a little more than half as broad as long.

Internal antennae a little shorter than the carapace, inner flagellum almost 3-times as long as the peduncle, outer flagellum nearly $2\frac{1}{2}$ -times as long as the latter. Penultimate joint of antennal peduncle very long and slender, 9-times as long as thick; the scaphocerite is a slender, acuminate spine just as long as the penultimate joint.

First pair of legs very unequal, the right the larger. Lower border of ischium and merus with spines, larger chela as long as the merus, palm little longer than the fingers and once and a half as long as broad; its upper border with two small, acute teeth at the distal end. Upper border of dactylus with 3 slender spines at its base. Left leg much slenderer, but little shorter. Lower edge of ischium and merus each with 6 spines, fingers slender, once and a half as long as the palm.

Slender merus of 2nd legs with 7 spines on lower border, fingers twice as long as the palm.

Length of single female 21 m.m., the carapace being 7,5 m.m. long.

11. *Axiopsis Picteti* (Zehntner), var. *spiniimana* n.

Stat. 209. Anchorage off the South point of Kabaëna-island.

Depth 22 M.

Together with two typical males of *Axiopsis Picteti* (Zehntner), that ought to be referred to this genus and not to *Paraxius* Bate, at the same Station two other specimens were collected, an egg-bearing female and a younger male, that are for the present considered and described as a variety of Zehntner's species. This variety chiefly differs from the type by the 1st pair of thoracic legs, the upper border of the chela being armed with strong spines and the outer surface of the palm being covered with rather conical, though mostly obtuse tubercles in stead of elongate ones. The palm and the fingers are not glabrous, but grown over with stiff hairs, and of the three ridges into which the upper surface of the dactylus is divided, the inner and outer ones are sharp, not rounded. Length of the female 25 mm.

Paraxiopsis n. subg.

A new subgenus of the genus *Axiopsis* Borr.

The rostrum is not continuous with the gastric region, but situated below the level of it, the carapace sloping anteriorly down to the rostrum. The antennal thorus (stylocerite and scaphocerite) are very small. *Paraxiopsis* differs from *Calocaris* Bell by the carapace presenting no keel in the hinder part, by the well-facetted and pigmented eyes and by a shallow-water habitat.

Type: *Paraxiopsis Brocki* de M.

12. *Axiopsis* (*Paraxiopsis*) *bisquamosa* n. sp.

Stat. 133. Anchorage off Lirung, Salibabu-island. Depth up to 36 M.

Rostrum narrow-triangular, pointed, reaching until the distal end of the 2nd joint of the antennular peduncle, armed at either side of its base with a strong, sharp tooth, directed forward; in front of this tooth the lateral margins of the rostrum carry each four extremely small teeth. A little behind the two large teeth, between which the carapace is carinate in the middle line, the gastric region carries at either side a low squamiform tubercle, that is rounded anteriorly.

Abdomen rounded, smooth. Caudal fan much resembling that of *Paraxiopsis Brocki* de M., telson almost once and a half as long as broad.

Penultimate joint of antennal peduncle 4-times as long as thick, stylocerite wanting, scaphocerite very small, with no tooth on the inner side of it.

Merus-joint of external maxillipedes with two strong spines on lower margin, carpus unarmed.

Right leg of 1st pair of a stout shape. Merus stout with a tooth a little beyond the middle of its lower margin, which, between this tooth and the ischium, is coarsely serrate. Carpus short, a little wider distally than it is long, its lower margin notched.

Chelae massive, as long as the carapace, unarmed; palm once and a half as long as broad and a little longer than the pointed fingers, smooth.

Merus of the four following legs quite unarmed.

Length of the single, probably young, specimen 10 m.m., the carapace 3,8 m.m., the abdomen 6,2 m.m. long.

13. *Calastacus euophthalmus* n. sp.

Stat. 139. Lat. 0° 11' S., long. 127° 25' E. Depth 397 M.

Closely allied to *Calastacus felix* Alcock and Anderson. Spines on the gastric region not arranged in the form of a horse-shoe, but in two straight rows, one at either side of the median carina, each with four sharp teeth; median carina with one sharp tooth just in front of the lateral rows, a little backward another much

smaller, though also sharp tooth and adjacent to it a low blunt tubercle.

Abdominal terga rounded above. Outer edge of the inner plate of the caudal swimmerets serrate, midrib carrying four or five spines along its whole length; outer rib of the two on the upper surface of the exopodite covered with nine or ten very small spinules, arranged irregularly.

Eyes with well-developed facets and with dark brown pigment.

Stylocerite reaching not yet to the middle of the penultimate joint of the antennular peduncle. Flagellum of the exopodite of the external maxillipedes much thinner, the joints in the middle of the flagellum, as also the following, longer than broad.

Lower border of the merus of the 1st pair of legs serrate, presenting 8 or 9 teeth (no spines) along its whole length; upper border unarmed. Fingers not gradually tapering into very slender, pointed tips, as in *Cal. felix*, but of the more usual shape and somewhat compressed; those of the larger, left hand just as long as the palm, those of the other little longer.

Calastacus longispinis Mc.Ardle has five teeth on either side of the rostrum, the eyestalks are more than half as long as the rostrum, the eyes are rudimentary and the stylocerite is longer.

One male. Length 21 m.m.

14. *Upogebia (Gebiopsis) ancylodactyla* n. sp.

Stat. 60. Haingsisi, Samau-Island, near Timor. Shore.

Closely related to *Upogebia (Gebiopsis) Darwinii* Miers, but distinguished by the following. Size much smaller, eggs few in number, large, diameter 0,9 m.m. broad (the eggs of *Upog. Darwinii* are very numerous, but smaller, 0,6—0,7 m.m. broad). Front obtuse, its length being $\frac{1}{9}$ of that of the carapace, as long as broad, and armed with 4 spinules, two on either side; gastric region denticulate and pubescent, as in the other species. No spine on the anterior margin of the carapace. Telson subquadrate, little broader than long.

Inner antennae a little shorter than the carapace, thicker flagellum just as long as the peduncle and composed of 12 joints, which, in the middle of the flagellum, are longer than broad. Outer antennae once and a half as long as the carapace.

Legs of 1st pair resembling those of *Upog. Darwinii*, but the fingers that measure one fourth the length of the whole chela, are strongly curved, more than in that species and much more than in *Upog. (Gebiopsis) hexaceras* Ortm. The prehensile edges of both fingers are entire, palm also unarmed. Carpus with a small spinule at the distal end of the inner margin of the upper surface and with a very small, sharp tooth at that of the lower.

Length of egg-bearing female 18,5 m.m.

15. *Upogebia (Upogebia) pugnar* n. sp.

Stat. 311. Sapeh-bay, East coast of Sumbawa. Depth up to 36 M.

Rostrum or front triangular, obtuse, somewhat longer than broad, measuring one fifth of the length of the carapace, itself included; lateral borders of the rostrum each with 5 small teeth. Lateral margins of the gastric region with 8 or 9 teeth, the foremost one little longer than the rest; gastric region covered with small teeth. Rostrum and anterior part of the gastric region hairy. Anterior margin of carapace on either side with one single spine. Abdomen almost twice as long as the carapace. Second and sixth somites nearly of the same length and a little longer than the 3rd—5th that are subequal; sixth somite a little broader than long, one third longer than the telson. Telson once and a half as broad as long, its length three fourths that of the 6th somite and with slightly concave, posterior edge. Lateral swimmerets longer than telson; straight anterior border of exopodite making a right angle with the truncate distal one; endopodite little shorter, pointed, with obtuse tip.

Inner antennae almost half as long as the carapace, 1st joint of their peduncle as also the antepenultimate joint of antennal

peduncle with a strong spine at the distal end of lower margin; other joints of antennal peduncle unarmed.

Legs of 1st pair resembling those of *Gebicula exigua* Alcock, but the dactylus impinges against a short, immobile finger; one single spine midway between the acute tip of the index and the carpus on the slightly concave, lower border of the inner surface of the somewhat distorted palm; upper margin of the palm with five equidistant spines.

Legs of 5th pair subcheliform; slightly curved dactylus 3-times as long as the immobile finger.

Length of single female without eggs 18,5 m.m.

16. *Upogebia (Upogebia) fallax* n. sp.

Stat. Haingsisi, Samau-Island. Depth 36 M.

Closely related to *Upogebia pugnae* n. sp.

Rostrum and carapace about as in this species. Abdomen twice as long as the carapace. Sixth somite longer than broad, almost once and a half as long as the second. Telson somewhat less broad than in *Upog. pugnae*, not yet half as long as the 6th somite; its posterior margin slightly concave as in *Upog. pugnae*.

Exopodite and endopodite of the caudal fan much resembling those of *Upog. pugnae*, but still longer; exopodite more than twice as long as the telson, anterior border nearly straight, making an obtuse angle with the distal margin; endopodite shorter than in *Upog. pugnae*.

First joint of the antennular peduncle and antepenultimate joint of antennal peduncle with a spine at the distal end of the lower border, as in *Upog. pugnae*; antepenultimate joint of antennal peduncle with a spiniform scaphocerite at the distal end of the upper border; penultimate joint of this peduncle with two equal spines on the lower margin.

Legs of 1st pair much as in *Upog. pugnae*, but the lower border of the not distorted palm with two small spines proximally. Dactylus 5-times as long as the immobile finger, its upper margin finely denticulate.

Legs of 5th pair subcheliform, dactylus strongly curved, twice as long as the immobile finger.

One incomplete specimen, probably a male, long 12 m.m.; carapace long 4 m.m., abdomen 8 m.m.

17. *Upogebia (Upogebia) ceratophora* n. sp.

Stat. 53. Bay of Nangamessi, Sumba. Depth up to 36 M.

Stat. 58. Anchorage off Seba, Savu. Depth up to 27 M.

A species of small size, distinguished, together with *Upog. (Upog.) monoceros* n. sp., by a strong, forwardly curved spine on the carinate, lower border of the rostrum.

Rostrum triangular or rather hastate, being narrowed at its base, measuring about one fifth the whole length of the carapace, once and a half as long as broad; its lateral margins armed each with 7 conical teeth and hairy. Lateral margins of the gastric region with 8 or 9 teeth, foremost tooth larger than the following, directed outward; the distance between these foremost teeth just as long as the rostrum. Gastric region with 4 longitudinal rows of small, low teeth, the two inner ones reaching until the middle of the rostrum. Sixth abdominal somite longer than the rest, quadrate, a little longer than the 2nd; telson a little shorter than 6th somite, nearly quadrate, its posterior margin emarginate. Exopodite of caudal fan obovate, rounded distally, half as broad as long; endopodite triangular, obtuse, a little more than twice as long as broad; both swimmerets longer than telson.

Internal antennae half as long as the carapace, flagella measuring two thirds of the length of the peduncle; 1st joint of peduncle with a spine on the lower border. External antennae twice as long as the carapace, lower border both of the antepenultimate and of the penultimate joint with a spine; flagella 4-times as long as the peduncle.

Carpus of the legs of 1st pair armed with 9 or 10 spines of different length. Propodite with an immobile finger, that is curved inward and the prehensile edge of which carries 5 or 6 small, acute teeth; upper border of the propodite armed above with 15

or 16 strong spines, arranged in three longitudinal rows; dactylus nearly straight, little shorter than the propodite, twice as long as the immobile finger.

Merus of 2nd legs just as long as that of 1st pair, 6-times as long as broad; upper border of the carpus with 2 spines, the lower with one; dactylus little shorter than the propodite. Fifth legs subcheliform.

Length of female 10,56 m.m., carapace 3,96 m.m. long, abdomen 6,6 m.m.

18. *Upogebia (Upogebia) monoceros* n. sp.

Station 4. Lat. 7° 42' S., long. 114° 12'.6 E. Anchorage off Djangkar (Java). Depth 9 M.

Closely related to *Upog. (Upog.) ceratophora* n. sp., both species being distinguished by the existence of a strong, forwardly curved spine on the lower border of the rostrum; it differs from *Upog. ceratophora* especially by the following characters.

Teeth on the lateral margins of the rostrum smaller, the two inner longitudinal rows of teeth on the gastric region wanting. Sixth abdominal somite exactly as long as the 2nd, telson one third broader than long, less deep emarginate; exopodite of caudal fan more obliquely ovate, because the anterior border is shorter than the posterior; endopodite shorter, not yet twice as long as broad. Flagella of internal antennae little shorter than the peduncle. The spine on the lower border of the penultimate joint of the antennal peduncle is situated not near the distal end, as in *Upog. ceratophora*, but near the proximal extremity.

Thoracic legs less slender. Upper border of the chela with 8 or 9 equidistant spines; lower border of the inner surface with one single slender spine midway between the inwardly curved, immobile finger and the carpal articulation; cutting-edge of the immobile finger unarmed.

Merus of the 2nd legs 4-times as long as broad; upper border of the carpus with 4 spines, lower with one.

Eggs not very numerous, globular, small, diameter 0,54—0,56 m.m.

Length of the only specimen 13.75 m.m., the carapace being 4,75 m.m. long.

19. *Callianassa (Calliactites) modesta* n. sp.

Station 47. Bay of Bima; near south fort. Depth 55 M.

Station 116. Lat. $0^{\circ} 58'5''$ N., long. $122^{\circ} 42'5''$ E. West of Kwandang-bay-entrance. Depth 72 M.

Station 254. Lat. $5^{\circ} 40'$ S., long. $132^{\circ} 26'$. Depth 310 M.

Station 261. Elat, West coast of Great-Kei-island at a depth of 27—310 M.

Carapace, the rostrum included, little more than one third of the length of the abdomen. Rostrum spiniform, as long as the 1st joint of the antennular peduncle. First abdominal somite strongly narrowed in the middle, not coalesced with the 2nd, as takes place in *Call. rotundicaudata* Stebb., with which this species is related. Second and sixth abdominal somites of equal length, somewhat longer than the other ones. Telson much smaller and shorter than 6th somite, little longer than broad, with small median tooth on the rounded posterior margin. Caudal swimmerets considerably longer than the telson, especially the oblong exopodite; additional row of spines on the exopodite rudimentary.

Merus and ischium of external maxillipedes moderately expanded.

Larger chelipede of 1st pair having the lower margin of the ischiopodite armed with 7 spines. Merus oval, with one tiny spinule in the middle of the lower margin. Carpus short, half as long as the palm, but equally wide. Fingers as long as the palm. Fingers of the smaller chelipede slender, $2\frac{1}{2}$ —3 times as long as the palm.

Propodite of third legs 3-times as long as broad, with parallel, nearly straight margins, without any trace of a backward produced lobe.

Length 13,5 M.

20. *Callianassa (Cheramus) indica* n. sp.

Station 16. Lat. $6^{\circ} 59' S.$, long. $115^{\circ} 24'.7 E.$ Bay of Kankamaraän, S. coast of Kangeang. Reef.

A species related to *Call. pachydactyla* A. M.-Edw. from the Cape Verde Islands, except perhaps as regards the larger chelipede, that is wanting in the only male that was collected.

Carapace one fourth of the whole length. Median rostral tooth broadly triangular, very short, subacute; lateral teeth, between the eyeplates and the antennal peduncles, still shorter, narrow-triangular, obtuse. Abdomen depressed, the somites of subequal length, the 4th a little shorter and the 6th a little longer than the rest. Caudal fan similar to that of *Call. mauritiana* Miers, but the telson, in proportion to its length, a little less broad, rounded posteriorly and very slightly concave in the middle line; endopodite a little broader than long and resembling that of *Call. pachydactyla*, but the rib in the middle is distinct.

Eyeplates as long as 1st joint of antennular peduncle, a little longer than broad at their base, triangular, anterior extremity rounded, outer margin oblique; eye dark black, small, situated on the outer margin, midway between the tip and the proximal end.

Internal antennae as long as the carapace, 1st and 2nd joint of the peduncle of equal length, 3rd once and a half as long as the 2nd; peduncle half as long as the longer flagellum.

External maxillipedes closely resembling those of *Call. pachydactyla*.

Joints of the smaller chelipede unarmed; merus oval, once and a half as long as broad. Carpus a little shorter than the merus and than the palm, almost as broad as long; palm a little narrowing distally, as long as the immobile finger. Fingers hairy, not toothed. In *Call. mauritiana* the carpus of the smaller chelipede is considerably longer than the palm and much longer than broad. Other legs as in *Call. pachydactyla*.

Abdominal appendages of the 1st somite uniramous, slender,

short, compressed, somewhat widening distally and terminating into two rounded lobes.

Length 90 m.m., carapace 23 m.m. long.

21. *Callianassa (Cheramus) moluccensis* n. sp.

Station Ambon, reef.

One single male was collected, the legs of the 1st and of the 4th pair are wanting. Apart from these legs, this species resembles most closely *Call. indica* n. sp., but it differs especially by the different shape of the eyepeduncles and of the abdominal appendages of the 1st somite.

Median rostral tooth a little longer and sharper, the lateral teeth very small and rounded. Telson a little broader in proportion to its length, resembling still more that of *Call. mauritiana* Miers, caudal swimmerets reaching beyond the telson, when directed backward; a small spinule at the base of the posterior rib of the exopodite.

The eyeplates that are different from those of *Call. mauritiana* Miers and *Call. Filholi* A. M-Edw., do not yet reach to the distal end of the 1st joint of the antennular peduncle; they are very little — one sixth — longer than broad at their base. The inner margins that are unarmed, diverge gradually from the tip of the median rostral tooth forward and then curve outward to an antero-external angle which is rather sharp and slightly turned upward and outward. Eye convex, situated on the outer margin of the plate, but larger than in *Call. indica*, distinctly faceted and black pigmented, situated as far from the proximal end of the outer margin as the eye is long, but a little farther from the antero-external angle. Upper surface of the peduncle sloping obliquely down in a lateral view, as in *Call. indica*.

Abdominal appendages of the 1st pair as in *Call. indica*, but of the two lobes into which they end distally, the inner one is obtuse, the outer, however, hookshaped, the hook being acute, reaching beyond the inner lobe and curved inward.

Length 60 m.m., carapace 16 $\frac{1}{2}$ m.m. long.

22. *Callianassa lobetobensis* n. sp.

Station 306. Lat. $8^{\circ} 27' S.$, long. $122^{\circ} 54'.5 E.$ Depth 247 M.

A species of small size, closely related to *Call. intermedia* n. sp. Carapace and spiniform rostrum as in this species, but the cervical groove situated at one fourth of the length of the carapace from its posterior margin. Abdomen as in this species, except the caudal fan. Telson bilobed, its lateral margins armed posteriorly with 2 moveable spines, median notch also with a strong spine; telson little shorter than the 6th somite. Endopodite shorter than the telson, rounded apically, a little more than half as broad as long. Exopodite a little longer than the telson, truncate apically, once and a half as long as broad; additional row of bristles almost reaching to the middle of the apical border, diverging very little from it.

Third joint of antennular peduncle 4-times as long as the 2nd and 5-times as long as thick. External footjaws pediform, merus rhomboid, a little more than half as long as the ischium, with small spine at the antero-internal angle.

Ischium of larger chelipede 5-times as long as broad, with 8—10 small spines on its lower margin; merus oval, as long as the ischium, $2\frac{1}{2}$ -times as long as broad, lower margin carrying 4 spines, the upper one near the base. Carpus a little shorter than merus. Palm once and a half as long as the carpus and once and a half as long as broad. Merus of smaller chelipede similar to that of the larger; carpus slender, somewhat longer than the merus, 4-times as long as broad; chela a little longer than the carpus, fingers slender, once and a half as long as the palm.

Propodite of 3rd legs quadrangular, twice as long as broad, distal border truncate, lower with 3 or 4 shallow notches, lobe on the hinder edge triangular, measuring one fifth of the length of the whole joint.

Length 20 m.m.

23. *Callianassa praedatrix* n. sp.

Station 204. Lat. $4^{\circ} 20' S.$, long. $122^{\circ} 58' E.$ Between islands

of Wowoni and Buton; northern entrance of Buton Strait.
Depth from 75—94 M.

A species of medium size, related to *Call. maldivensis* Borr. Rostrum spiniform, reaching to the middle of 1st joint of antennular peduncle. Carapace one third the length of the abdomen, Abdomen, except the caudal fan, similar to that of *Call. joculatrix*, 1st somite saddle-shaped, 2nd and 6th of equal length, longer than the rest. Telson measuring three fourths of the length of the 6th somite, slightly longer than broad, hind border emarginate with sharp median tooth curved forward. Both swimmerets longer than the telson, inner ramus once and a half as long as broad, oval, rounded apically. Exopodite not yet once and a half as long as broad, anterior border straight, making a right angle with the apical one and this angle quite distinct, not rounded; additional series of short bristles reaching not yet to the middle of the apical border, contiguous to and diverging very little from it.

Flagella of inner antennae slightly longer than the peduncle, 3rd joint of the peduncle 3-times as long as second. Antennal peduncle longer than the antennular one. External foot-jaws similar to those of *Call. rotundicaudata* Stebb., merus a little broader than long and than the ischium, armed anteriorly with a spine.

The lower border of the ischium of the larger chelipede armed with 11 spines; merus broadly oval, not yet once and a half as long as broad, lower margin expanded, spiniferous and denticulate along its whole length. Carpus short, more than once and a half as deep as long; palm twice as long as the carpus, slightly broader than it and longer than the fingers. Lobe at the hinder edge of the propodite of 3rd legs obtuse, triangular, measuring one sixth of the length of the whole joint; three shallow notches of equal length on the lower margin, the first of them a little farther distant from the proximal than from the distal extremity of the margin.

Length 23 m.m.

24. *Callianassa propinqua* n. sp.

Station 114. Lat. $0^{\circ} 58'.5$ N., long. $122^{\circ} 55'$ E. Kwandang-bay-entrance. Depth 75 M.

Closely allied to *Call. praedatrix* n. sp., distinguished by the following. Telson two thirds of the length of the 6th somite, one fourth longer than broad, regularly rounded posteriorly and carrying at either side two small, moveable spines, 0.06 m.m. long; the posterior spine is 3-times as far distant from the median tooth as the latter is long and this distance is once and a half as long as the interspace between the two spines. Inner caudal swimmeret a little more than half as broad as long, appearing broadest at one fourth of its length from the base and hence narrowing to the obtuse apex. Exopodite elongate, quadrangular, almost twice as long as broad; not only the antero-external, also the postero-external angle is distinct, the nearly straight apical border making right angles both with the anterior and the posterior margin. Additional row of bristles as in *Call. praedatrix*.

Upper flagellum of internal antennae distinctly thicker, i. e. once and a half as thick as the lower; the upper composed of 14 joints, the lower of 11.

Ischium of external maxillipedes twice as long as broad.

Lobe on the hinder edge of the propodite of 3rd legs rather sharp, one fourth the whole length; lower margin not emarginate, but the hairs with which it is fringed, reddish-brown coloured as in *Call. praedatrix*. Ischium of smaller chelipede of 1st pair of legs slender, armed with 6 spines; the merus as long as the ischium with one spine on the middle of its lower margin; carpus slender, shorter than the hand; fingers once and a half as long as the palm.

Length of egg-bearing female 13 m.m.

25. *Callianassa intermedia* n. sp.

Station 5. Lat. $7^{\circ} 46'$ S., long. $114^{\circ} 30'.5$ E. Depth 330 M.

Closely allied to *Call. praedatrix* n. sp. Carapace and abdomen,

except the caudal fan, as in this species. Telson as in *Call. pugnatrix*, a little longer than broad, bilobed, with a small tooth in the median notch, attached to the lower surface; lateral edges with two spines posteriorly. Swimmerets not longer than telson. Endopodite oval, not yet once and a half as long as broad, rounded apically. Exopodite as in *Call. praedatrix*, but only one fifth longer than broad; additional series of spines as in *Call. pugnatrix*, strongly arcuate and diverging much from the straight apical border, spines as stout and as long as those of the rounded postero-external angle of the exopodite.

Flagella of internal antennae once and a half as long as their peduncle, upper flagellum twice as thick as the other.

Larger chelipede as in *Call. praedatrix*, but the merus is twice as long as broad, its sharp lower edge is armed with 8 slender spines and the hand has no groove on the outer or inner surface.

Propodite of 3rd legs with obtuse lobe on the hinder edge, the lobe measuring one seventh of the whole length of this joint and the first of the three shallow notches on the lower margin is farther distant from the distal than from the proximal extremity of the margin.

Length of the only specimen that was collected, a female without eggs, 16,4 m.m.

26. *Callianassa joculatrix* n. sp.

Station 2. Lat. $7^{\circ} 25' S.$, long. $113^{\circ} 16' E.$ Madura-strait.

Depth 56 M.

Station 5. Lat. $7^{\circ} 46' S.$, long. $114^{\circ} 30'.5 E.$ Depth 330 M.

Station 19. Lat. $8^{\circ} 44'.5 S.$, long. $116^{\circ} 2'.5 E.$ Bay of Labuan

Tring, west coast of Lombok. Depth 18—27 M.

Station 47. Bay of Bima; near south fort. Depth 13—31 M.

Station 53. Bay of Nangamessi, Sumba. Depth up to 36 M.

Station 71. Makassar and surroundings. Depth up to 32 M.

Station 114. Lat. $0^{\circ} 58'.5 N.$, long. $122^{\circ} 55' E.$ Kwandang-bay-entrance. Depth 75 M.

Station 115. East side of Pajunga Island. Kwangdang-bay.

Depth 31 M.

Station 213. Saleyer-anchorage and Surroundings, including

Pulu Pasi Tanette, near the North point of Saleyer-island.

Depth up to 36 M.

Station 254. Lat. $5^{\circ} 40' S.$, long. $132^{\circ} 26' E.$ Depth 310 M.

Station 306. Lat. $8^{\circ} 27' S.$, long. $122^{\circ} 54'.5 E.$ Depth 247 M.

Closely related to *Call. maldivensis* Borr.

Carapace, without the rostrum, one third of the length of the abdomen. Rostrum spiniform, barely reaching beyond the middle of the 1st joint of the antennular peduncle. Second abdominal somite longer than the rest. Telson considerably shorter than 6th somite, a little broader than long, with small median tooth on the posterior border. Swimmerets longer than the telson, about once and a half as long as broad; endopodite broadly rounded, exopodite rhomboidal, the anterior margin making an acute, though rounded angle with the apical one; additional series of setae diverging little from the apical border and reaching to the middle of it.

Third joint of antennular peduncle twice as long as the 2nd, antennal peduncle as long as the antennular one. External maxillipedes subpediform, ischium twice as long as broad, merus triangular, longer than broad and shorter than the ischium.

Larger chelipede resembling that of *Call. maldivensis*, but the merus is armed with one single spiniform tooth at the base of the lower margin and usually with two small spines at the proximal end of the upper. Carpus longer than in that species, often longer than the palm, the lower border of the latter not serrate. Carpus of smaller chelipede longer than the merus and longer than the hand, slender; fingers straight, slender, unarmed, once and a half to two times as long as the palm. Hinder edge of propodite of 3rd legs with large, rounded lobe posteriorly.

Length 18,5 m.m.

27. *Callianassa pugnatrix* n. sp. *

Station 5. Lat. $7^{\circ} 46' S.$, long. $114^{\circ} 30'.5 E.$ Depth 330 M.

Carapace, rostrum included, a little longer than one third the length of the abdomen. Carapace without antennal tooth. Rostrum spiniform, as long as 1st joint of antennular peduncle. Abdomen, except the telson, resembling that of *Call. jocularis*, as regards the relative length of the somites.

Telson quadrate, very slightly longer than broad, bilobed posteriorly, with small sharp tooth in the median notch. Caudal swimmerets longer than the telson; inner plate oblong, almost twice as long as broad, obtuse; exopodite pear-shaped, once and a half as long as broad, longer than the inner plate, broadly and regularly rounded apically. Additional row of spines on the exopodite short, measuring one fourth of its width, rather much divergent from the apical border.

Inner antennae measuring three fourths of the length of the carapace; antennular flagella, of which the upper is much thicker than the other, about as long as their peduncle; 3rd joint of the latter 3-times as long as the 2nd. Antennal peduncle little longer than the other.

External maxillipedes similar to those of *Callianassa modesta* n. sp., but the merus is broader anteriorly and unarmed.

Larger chelipede having the merus armed with a strong spine at the base of the lower border. Carpus little longer than wide, shorter than the palm. Palm longer than the fingers, slightly longer than wide. Lobe on hinder edge of the propodite of 3rd pair small, obtuse, measuring $\frac{1}{10}$ of the length of the propodite, that is half as broad as long.

Length 15 m.m.

28. *Callianassa placida* n. sp.

Station 58. Anchorage off Seba, Savu, Reef.

Station 142. Anchorage off Laiwui, coast of Obi Major, Reef.

Closely related to *Call. mucronata* Strahl.

Carapace anteriorly trispinose, as in *Call. tridentata* Mart., median spine extending a little beyond the middle of 1st joint of the antennular peduncle, lateral spines measuring two fifths of the

middle one. Abdomen and caudal fan as in *Call. mucronata*.

Eyestalks rounded anteriorly, eye black pigmented, cornea distinctly faceted occupying the distal third part of the stalks. Inner antennae almost as long as the carapace, flagella once and a half as long as the peduncle, 3rd joint of the peduncle once and a half as long as the 2nd. Ischium of external maxillipedes very little longer than broad, merus as broad as long, propodite strongly expanded, lamellar, just as broad as the merus.

Legs of 1st pair as in *Call. mucronata*, but the ischium is armed in both with 7 or 8 spines on its lower margin. Palm of larger chelipede once and a half as long as the carpus, carpus barely broader than long. Propodite of 3rd legs with obtuse lobe on hinder edge, lower margin slightly concave, not emarginate, propodite not yet twice as long as broad.

Length 30,5 m.m.

29. *Callianassa Sibogae* n. sp.

Station 5. Lat. 7° 46' S., long. 114° 30'.5 E. Depth 330 M.

Carapace comparatively large, little less than half the length of the abdomen, rostrum included. Rostrum lamellar, strongly compressed, with sharp upper edge, acuminate, as long as 1st joint of the antennular peduncle. First abdominal tergum saddle-shaped, carrying on the middle of its wider posterior part a compressed, low tubercle, appearing here thus carinate. Sixth somite longer than the rest, 3rd little shorter than 2nd. Abdomen smooth, not carinate. Telson slightly longer than broad. Caudal swimmerets considerably longer than the telson. Endopodite half as broad as long, with obtuse, rounded apex; exopodite a little more than half as broad as long, rounded apically, antero-external angle obtuse, moderately distinct; additional row of bristles, on the upper surface of the exopodite, rudimentary, very short, diverging but little from the apical border.

Cornea semiglobular, very prominent; pigment almost unrecognizable.

Flagella of inner antennae slightly longer than their peduncle,

lower flagellum half as thick as the upper; 3rd joint of antennular peduncle 4-times as long as the 2nd. Antennal peduncle longer than that of the inner antennae.

External maxillipedes subpediform. Ischium quadrangular, twice as long as broad in the middle, slightly narrowing anteriorly; merus quadrangular, shorter than the ischium, somewhat widening anteriorly. The three last joints are of subequal length, penultimate barely broader than the carpus, dactylus finger-shaped. In the single specimen, that was collected, the thoracic legs, except those of the 2nd and 5th pair, are wanting.

Length 23 m.m.